

AMENDMENTS TO THE CLAIMS

Please amend the claims as indicated in the following listing of all claims:

1-8. (cancelled)

9. (previously presented) A superscalar processor that, for a given instruction instance, performs, over plural execution cycles of the superscalar processor, instruction grouping for dispatch, including both intra-group and inter-group dependency checking, wherein the instruction grouping for dispatch takes the plural execution cycles to complete.

10. (previously presented) The superscalar processor of claim 9, further comprising:  
grouping logic implementing plural early pipeline stages of the superscalar processor;  
and  
plural execution units of varying pipeline depth coupled to receive instructions  
dispatched from the grouping logic.

11. (previously presented) The superscalar processor of claim 9,  
wherein the instruction grouping identifies successive groups of instructions from an  
instruction stream for dispatch to respective ones of plural execution units of the  
superscalar processor.

12. (previously presented) The superscalar processor of claim 11,  
wherein the superscalar processor dispatches all instructions from a particular one of the  
successive groups before dispatching any instructions from a subsequent one of  
the successive groups.

13. (previously presented) The superscalar processor of claim 9,  
wherein the intra-group dependency checking spans at least two of the plural execution  
cycles.

14. (previously presented) The superscalar processor of claim 9,

wherein the intra-group dependency checking is independent of the inter-group dependency checking.

15. (previously presented) The superscalar processor of claim 9, wherein data dependency and resource allocation checks in earlier pipeline stages of instruction grouping are based, at least in part, on a predicted subsequent state of the superscalar processor.

16. (previously presented) The superscalar processor of claim 9, wherein non-deterministic conditions are evaluated in a final stage of instruction grouping prior to dispatch.

17. (previously presented) A processor comprising:  
plural functional units that execute instructions in respective numbers of processor cycles; and  
grouping logic coupled to the functional units and pipelined to compute, over plural cycles,  $T$ , of the processor, a future state,  $S(t+T)$ , of the processor based on a prior state,  $S(t)$ , of the processor and based thereon to select a group of instructions from a program sequence thereof for dispatch to the functional units,  
wherein the future state computing takes the plural cycles to complete.

18. (previously presented) The processor of claim 17, further comprising:  
wherein intra-group dependency checking by the pipelined grouping logic spans two or more of the  $T$  cycles.

19. (previously presented) The processor of claim 17, further comprising:  
wherein inter-group dependency checking is performed independently of intra-group dependency checking.

20. (previously presented) The processor of claim 17,  
wherein intra-group dependencies are checked by the pipelined grouping logic beginning in a first of the  $T$  cycles; and

wherein non-deterministic dependency conditions are checked during a last of the T cycles.

21. (previously presented) The processor of claim 20,  
wherein inter-group dependencies are checked independent of the intra-group dependencies.

22. (previously presented) The processor of claim 17,  
wherein the grouping logic implements T stages of a pipeline of the processor.

23. (previously presented) The processor of claim 17,  
wherein T is four.

24. (previously presented) The processor of claim 17,  
wherein the functional units include at least one functional unit capable of receiving and completing an instruction for each of the processor cycles.

25. (previously presented) The processor of claim 17,  
wherein the functional units include at least one functional unit requiring multiple of the processor cycles for receiving and completing an instruction.

26. (previously presented) A method of operating a processor, the method comprising:  
identifying successive groups of instructions for dispatch to respective ones of plural execution units of the processor;

performing, during plural pipelined execution cycles of the processor, dependency checking amongst instructions of a later one of the groups and between the instructions of the later group and instructions of a preceding one of the groups;  
and

dispatching instructions of the later group only after all instructions of the preceding group have been dispatched,

wherein the performed dependency checking takes the plural pipelined execution cycles to complete.

27. (previously presented) The method of claim 26,  
wherein the dependency checking is performed by pipelined grouping logic.
28. (previously presented) The method of claim 26,  
wherein intra-group dependency checking and within-group resource allocation are  
performed in successive processor cycles by pipelined grouping logic.
29. (previously presented) The method of claim 26,  
wherein intra-group dependency checking is performed independent of inter-group  
dependency checking.
30. (previously presented) The method of claim 26,  
wherein non-deterministic conditions are evaluated in a final one of the pipelined  
execution cycles implemented by pipelined grouping logic.
31. (previously presented) The method of grouping instructions for dispatch to  
execution units of a processor, the method comprising:  
in a first cycle of processor execution, identifying plural candidate instructions for an  
instruction group;  
in a subsequent cycle of processor execution, beginning intra-group dependency checking  
as amongst instructions of the instruction group;  
in a cycle of processor execution prior to dispatch of any instruction from the instruction  
group, checking non-deterministic conditions; and  
in a cycle of processor execution prior to the non-deterministic dependency condition  
checking, initiating inter-group dependency checking between instructions of the  
instruction group and instructions of one or more prior instruction groups,  
wherein, for instruction instances of the instruction group, dependency checking, which  
includes the intra-group dependency checking and the inter-group dependency  
checking, takes plural of the cycles of processor execution to complete.
32. (previously presented) The method of claim 31, further comprising:

dispatching one or more instructions of the instruction group only after all instructions of the one or more prior instruction groups have been dispatched.

33. (previously presented) The method of claim 31,  
wherein the non-deterministic condition checking is performed conservatively, based on  
an assumption of no change in condition.

34. (previously presented) The method of claim 31,  
wherein the non-deterministic condition checking is performed aggressively, computing  
dispatch conditions for at least two alternatives including no change in condition  
and condition resolution; and  
wherein a control signal is selective for a particular one of the computed dispatch  
conditions.

35-36. (cancelled)